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(71) Applicant
Samsung Electronics Co, Ltd

(Incorporated in the Republic of Korea)

416 Maeton-dong, Kwonseon-ku, Suwon-si,
Kyungki-do, Republic of Korea

(72) Inventor
Shin Joo

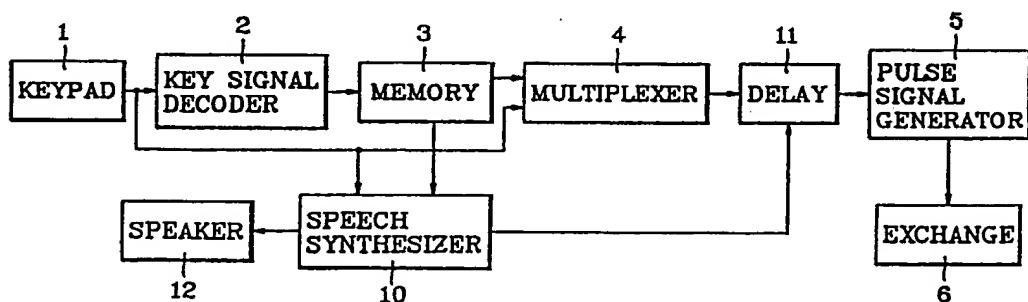
(74) Agent and/or Address for Service
Saunders & Dolleymore
9 Rickmansworth Road, Watford, Herts, WD1 7HE,
United Kingdom

(54) Telephone

(57) A telephone for identifying an intended recipient enables a user to input a telephone number and/or a shortened one of the recipient, and the telephone acoustically outputs information about the intended recipient such as his name and/or firm name, allowing the user to determine whether the telephone number and/or shortened one has been correctly dialled.

Multiple acoustic signals are stored in a memory (3), at addresses corresponding to respective telephone numbers or speed-dial code numbers, by the user when the device is in record mode. Then to place a call, the user dials a telephone number, and the number is used to address the appropriate number from memory, and to address corresponding name and/or firm name which is converted into an analog signal, which is outputted to an electroacoustic transducer such as a speaker (12). The actual dialling of the number is delayed for a short period to give the user the opportunity to hear the acoustic information, and cancel the call if it is a wrong number.

FIG. 2



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FIG.1(Prior Art)

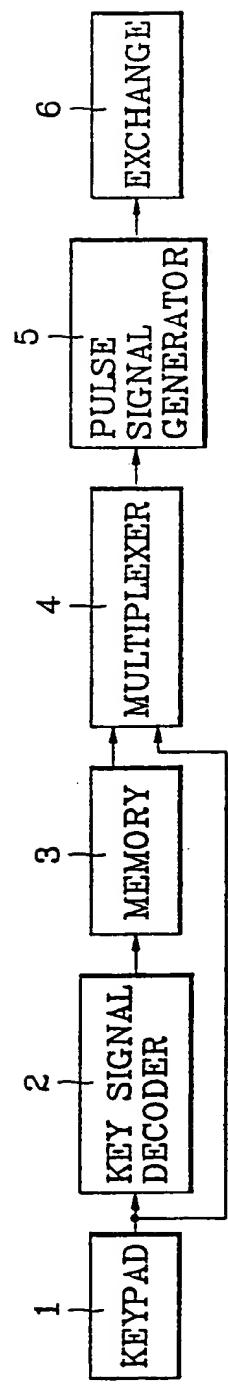


FIG.2

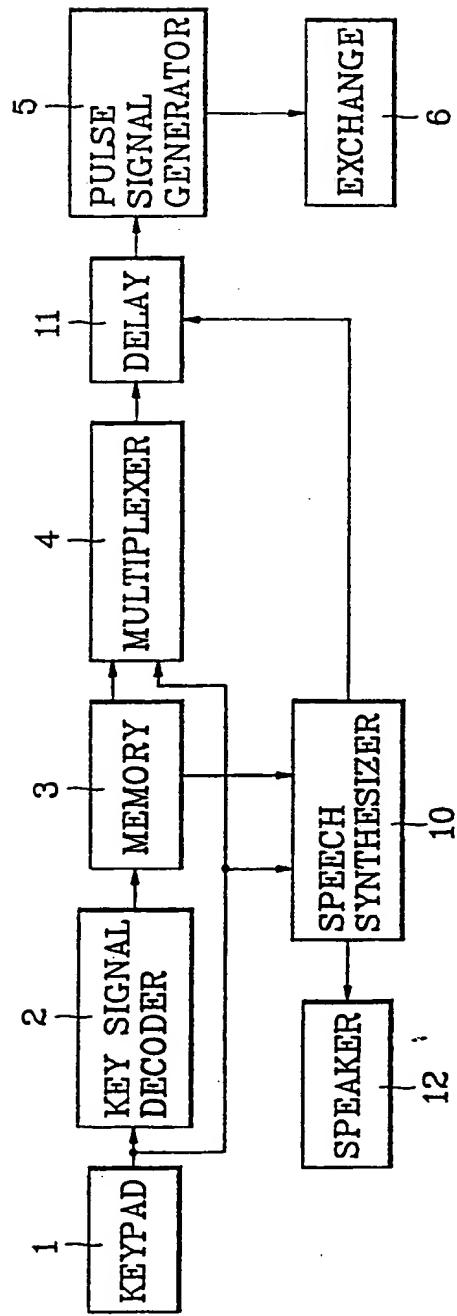
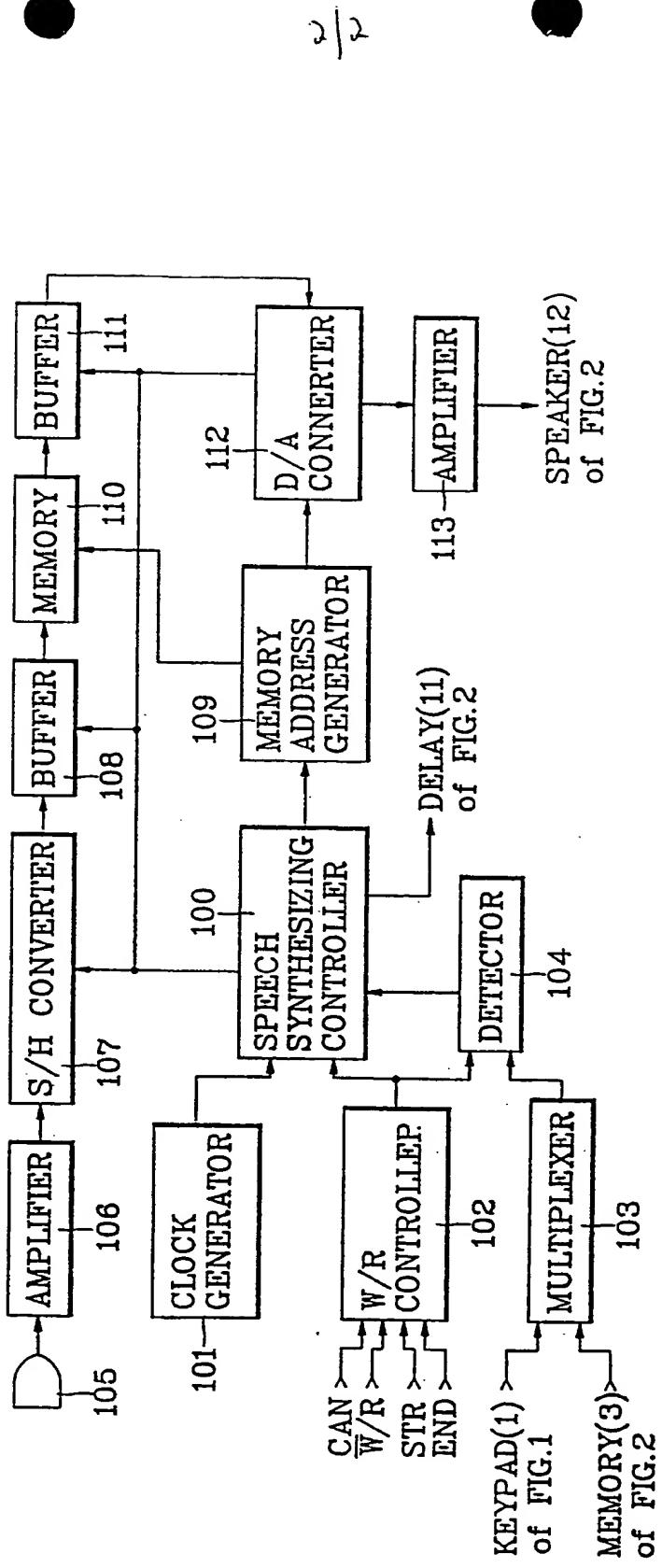


FIG. 3



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TELEPHONE

This invention relates to a telephone. In particular it relates to a telephone including means for identifying the party being called by providing acoustical information corresponding to a selected telephone number, prior to actually dialling the number.

A telephone system and/or method for identifying callers is disclosed in, inter alia, US Patent No. 4,672,660, which, however, relates to an apparatus for permitting residential or business telephone subscribers to identify who is placing a telephone call to the subscriber. There are numerous related arts similar thereto, but the present invention relates to a system that a subscriber can identify whether he key-inputs a telephone number (or shortened number (speed dial code)) of a recipient caller without error. With conventional telephones, when a subscriber key-inputs a telephone number, a recipient is called, by outputting a pulse signal according to the inputted telephone number.

Figure 1 is a circuit diagram of a conventional telephone which includes: an input device such as a keypad 1 by which telephone numbers and shortened ones are stored; a key signal decoder 2 for decoding whether a key signal that is outputted from the input device is a telephone number; a memory 3 for outputting a telephone number selected by an output signal of the decoder 2 after a telephone number corresponding to a shortened number is stored; a multiplexer 4 for selectively outputting a telephone number between telephone numbers outputted respectively from the input device 1 and the memory 3; and a pulse signal generator 5 for outputting a pulse signal according to the output signal of the multiplexer 4 and transmitting the pulse signal to an exchange 6.

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The input device 1 is a telephone keypad having a plurality of buttons for generating signals.

According to such a conventional telephone, when 5 a subscriber inputs a telephone number, the number is outputted from the keypad 1 and into the pulse signal generator 5 through the multiplexer 4, and the pulse signal generator 5 outputs to the exchange 6 a pulse signal according to the number thereby placing the call.

When a subscriber inputs a shortened number of an 10 intended recipient, the inputted shortened number is deciphered in the key signal decoder 2, and is outputted to the memory 3 which outputs an actual number corresponding to the shortened number. The actual number 15 is inputted to the pulse signal generator 5 through the multiplexer 4. Therefore, the pulse signal generator 5 outputs to the exchange 6 a pulse signal according to the corresponding telephone number.

The aforementioned conventional telephone, 20 however, has some disadvantages as follows:

The conventional telephone does not have the 25 function of identifying an intended recipient prior to the recipient answering the telephone. Thus, when a subscriber incorrectly remembers or improperly inputs the telephone number, a wrong number is the result.

There exists a telephone enabling the caller to ascertain an inputted telephone number and/or shortened number, showing the inputted number on a display equipped therewith, as he inputs the number of an intended 30 recipient. According to this system, however, if a user incorrectly remembers a telephone number of an intended caller it still has the defect of calling a wrong number.

The present invention arose in an attempt to 35 provide a telephone for identifying the recipient of a call being placed.

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A telephone according to the present invention has a multiplexer selectively outputting a telephone number corresponding to a telephone number outputted from a keypad and/or a shortened one outputted from a memory and a pulse signal generator for calling a recipient, outputting to an exchange a pulse signal according to the output signal of the multiplexer, and includes: a speech synthesizer for storing and outputting vocal signals of information concerning the recipient such as names and/or firm names according to the output signal out of the keypad and the memory, and controlling the output of telephone numbers; a delay device for delaying and outputting to the pulse signal generator the output signal of the multiplexer according to the control of the speech synthesizer; and electroacoustic transducer for converting electric signals from the speech synthesizer corresponding to the information about the recipient into acoustic signals.

With such a telephone a user stores in a memory the desired information about the recipients, such as names and/or firm names corresponding to telephone numbers and shortened numbers. Then, to place a call, the telephone outputs an acoustic signal with information corresponding to an inputted telephone number so that the user can confirm that he has dialled the proper number, and, after a delay for the acoustic output, a telephone number corresponding to the inputted telephone number and/or shortened one is outputted to make a call to the recipient.

When it comes to storing names and firm names, a telephone number and/or shortened one, a subscriber inputs telephone numbers and/or shortened ones, changing the present mode into a recording mode. Then, as he inputs vocal signals such as names and/or firm names or

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recipients by using a microphone, a speech synthesizing controller stores in a memory the information inputted using the inputted telephone numbers and/or shortened ones.

When a user inputs a telephone number and/or shortened one in order to make a call, the telephone call is delayed for a given short time, until after outputting to an electroacoustic transducer, to allow the user to confirm the recipient information corresponding to the inputted telephone number and/or shortened one, the telephone number in memory corresponding to the number and/or shortened one is outputted and thus the call is placed.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of a conventional telephone;

Figure 2 is a block diagram of a telephone according to the present invention; and

Figure 3 is a detailed block circuit diagram of a speech synthesizer.

Referring now to Figure 2, a telephone for identifying a recipient according to the present invention will be described.

Like reference numerals as those used in Figure 1 represent like elements.

As can be seen from the block diagram of Figure 2, a telephone in accordance with the invention has a multiplexer 4 selectively outputting a telephone number corresponding to a telephone number received from a keypad 1 and/or a shortened one outputted from

a memory 3. The phone also has a pulse signal generator 5 for calling the recipient, by outputting the number to an exchange 6 by means of a pulse signal according to the output signal of the multiplexer 4. The phone also has:

a speech synthesizer 10 for storing and outputting vocal signals of the information of intended recipients such as names and/or firm names according to the output signal out of the keypad 1 and the memory 3, and controlling the output of telephone numbers;

a delay 11 for delaying and outputting to the pulse signal generator 5 the output signal of the multiplexer 4 according to the control of the speech synthesizer 10 ; and an electroacoustic transducer such as a speaker 12 for outputting vocal signals of the names and/or firm names of recipients corresponding to the output signal of the speech synthesizer.

According to such a telephone for identifying recipient in the present invention, in case of storing a name and/or firm name

of corresponding to a telephone number and/or shortened one, the telephone number which is to be stored is dialed by operating the keypad 1, and then the inputted telephone number is outputted from the keypad 1 and subsequently inputted into the speech synthesizer 10.

In case of inputting a shortened number of an intended recipient, the inputted shortened number is decoded in a key signal decoder 2, and according to the decoded signal, a telephone number corresponding to the shortened number is outputted from the memory 3 according to the decoded signal, and the outputted telephone number is inputted into the speech synthesizer 10.

Then, the speech synthesizer 10 reads the telephone numbers that were respectively inputted from the keypad 1 and the memory 3, and converts a vocal signal (as to the information of the intended recipient) inputted by a user into a digital signal. According to the telephone number that was read, the speech synthesizer stores the vocal signal as to the name and/or firm

name of the recipient as converted into the digital signal. After storing such information, when a user inputs a number to place a call, a telephone number selectively outputted between numbers outputted from the keypad 1 and the memory 3 according to dialing is inputted into the delay 11 through the multiplexer 4, and is delayed for a given time. Subsequently, the selectively outputted telephone number is inputted into the speech synthesizer 10.

Then, after locating (e.g., addressing) the information corresponding to the inputted telephone number among the stored information and modulating it into an analog signal, the speech synthesizer 10 outputs the analog signal to a speaker 12 to inform the user of the selected recipient and outputs a telephone number which is delayed for a given time by controlling the delay 11. The telephone number outputted from the delay 11 is inputted into the pulse signal generator 5, which outputs to the exchange 6 a pulse signal corresponding to the telephone number thereby placing the call.

Where a name corresponding to the inputted telephone number is not in memory, the synthesizer 10 controls the delay 11 so that the telephone number is outputted at once, rather than being delayed.

FIG. 3 is a detailed block circuit diagram of an embodiment of the speech synthesizer 10 of FIG. 2, including:

a speech synthesizing controller 100 for storing and outputting the recipient information corresponding to an inputted telephone number and controlling operation of the delay 11 ;

a clock generator 101 for producing clock signals;

a recording/reproduction controller 102 (which is referred to as a W/R controller) for controlling record and reproduction of vocal signals according to an inputted cancel signal CAN, read & write signal W/R , start signal START, and end signal END ;

a multiplexer 103 for selectively outputting a telephone number outputted from the keypad 1 and memory 3 ;

a telephone number detector 104 for detecting a telephone number outputted from the multiplexer 103 according to an output

signal from the W/R controller 102 and inputting the detected telephone number as an address signal into the speech synthesizing controller 100;

an amplifier 106 for amplifying vocal signals such as names and/or firm names of potential call recipients inputted through the microphone 105;

a sampling/holding and analog/digital converter 107 for sampling & holding the output signals from the amplifier 106 according to the control of the controller 100, and converting the output signals into digital output signals;

a memory 110 for storing and outputting the digital vocal signals that were outputted from the converter 107 and then were passed through a buffer 108 according to the address signals that were outputted from the speech synthesizing controller 100 and passed through a memory address generator 109;

a digital/analog converter 112 for converting the digital vocal signals that were outputted from the memory 110 and passed through the buffer 111 into analog signals ; and

an amplifier 113 for amplifying the output signals of the digital/analog converter 112 and outputting the amplified signals to the speaker 12.

According to the present invention, the clock generator 101 outputs clock signals 101 and produces the outputted signals as operating clock signals for controller 100. To store names, when the W/R signals are inputted at low potential, the W/R controller 102 outputs to controller 100 recording control signals according to low-potential W/R signals, and the controller 100 changes to a recording mode and outputs start signal START, whereby the W/R controller 102 initiates recording.

If a user inputs a vocal signal of a name and/or firm name through microphone 105, the inputted vocal signal 106 is amplified, and subsequently inputted to memory 110. More specifically, after the sampling/holding and analog/digital converter 107 samples the vocal signal for a given duration according to controller 100 and holds it, the vocal signals are converted into digital signals and are outputted. The outputted

digital signals are stored in the buffer 108 and then passed to memory 110.

If a user inputs a telephone number and/or shortened number that was already inputted, the multiplexer selects the telephone number inputted from the keypad 1 and a telephone number corresponding to the shortened number inputted from the memory 3, and then the selected telephone number is inputted into the telephone detector 104. Subsequently, the telephone number detector 104 detects a telephone number corresponding to the inputted telephone number and/or shortened one, and the detected telephone number is inputted to the controller 100 as an address signal.

Then, according to the telephone number corresponding to the inputted telephone number and/or shortened one, the controller 100 controls the address of memory 110 through the memory address generator 109. The digital vocal signal outputted from buffer 108 is stored in memory 110. By repeating such an operation, several names are stored in memory 110, and storing names is completed

names is completed by inputting the end signal END.

When the W/R signal is inputted at high potential such as where a user seeks to place a call, W/R controller 102 outputs to controller 100 a control signal according to the inputted high potential W/R signal, and then controller 100 changes the present mode from recording mode.

When a user dials a telephone number and/or shortened one, multiplexer 103 selects a telephone number inputted from the keypad 1 and memory 3, and the selected telephone number is inputted into the telephone number detector 104, detector which detects the inputted telephone number, and inputs it to controller 100 as an address enable signal.

Then, controller 100 outputs to address generator 109 a control signal according to the output signal from detector 104. Generator 109 outputs an address signal according to the control signal, and the address signal is inputted into memory 110. Thus, the name corresponding to the telephone number is outputted from memory 110.

The digital vocal signal corresponding to the name outputted from memory 110 is inputted to digital/analog converter 112 through buffer 111, and is converted into an analog signal. After being amplified in amplifier 113, the amplified analog signal is outputted to speaker 12 so that the user can confirm the name. Outputting to delay 11 the control signal, the speech synthesizing controller 100 outputs to the pulse signal output device 5 the telephone number delayed in the delay 11.

If the user determines that the number was improper, he inputs cancel signal CAN which passes to controller 100 through W/R controller 102. Then, controller 100 outputs to the delay device 11 a control signal in order to inhibit outputting the telephone number.

If the inputted telephone numbers and/or shortened ones are not stored in memory 110, controller 100 outputs to the delay 11 a control signal to pass the number to the pulse signal generator 5.

As above-described in detail, a user dials a telephone

number and/or shortened one, a vocal signal of the name and/or firm name of the party being called (i.e., corresponding to the inputted telephone number) is accessed from memory and outputted, and so a user may confirm that he is calling the proper party, thereby preventing him from reaching a wrong number.

A great variety of modifications and adaptations may be made without departing from the spirit and scope of the present invention as described above. The described embodiment is provided for illustration, and the appended claims are not limited thereto.

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CLAIMS

1. A telephone comprising a memory for storing telephone numbers, a multiplexer for selectively outputting a telephone number selected from the memory in response to a number being inputted at a keypad, a pulse signal generator for outputting a pulse signal according to the selected telephone number, a speech synthesizer for storing and outputting vocal signals corresponding to stored information relating to selected telephone numbers and controlling calling of telephone numbers; an electroacoustic transducer for converting electric aural signals received from the speech synthesizer corresponding to the information into acoustic signals; and a delay means for delaying calling by delaying output of the multiplexer to the signal pulse generator according to the control of the speech synthesizer.
2. A telephone as claimed in Claim 1, wherein the speech synthesizer comprises; a speech synthesizing controller for storing and outputting the information corresponding to an inputted telephone number and controlling operation of the delay means; a recording/reproduction controller for controlling recording and reproduction of vocal signals according to an inputted cancel signal, read and write signal W/R, start signal START, and end signal; a further multiplexer for selectively outputting a telephone number from the keypad and memory; a detector for detecting a telephone number outputted from the further multiplexer according to an output signal from the W/C controller and inputting the detected telephone number as an address signal to the speech synthesizing controller; and a speech signal processing means for storing vocal signals inputted through a microphone under control of the speech synthesizing controller and outputting to the

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electroacoustic transducer the stored vocal signals.

3. A telephone as claimed in Claim 2, wherein the speech signal processing means comprises: means for 5 sampling and holding the inputted vocal signals corresponding to the information under control of the speech synthesizing controller for a given duration and converting the vocal signals into digital signals; means for storing and outputting the digital vocal signals 10 outputted from the means for sampling and holding and converting; and means for converting the digital signals outputted from the means for storing into analog signals and issuing the converted analog signals to the electroacoustic transducer.

15 4. A telephone as claimed in any one of Claims 1 to 3 wherein the information is about a party being called, and is a name of the party.

5. A telephone system including a telephone as claimed in any of Claims 1 to 4, and an exchange for 20 receiving the pulse signal and calling the selected telephone number.

6. A telephone substantially as hereinbefore described with reference, to, and as illustrated by, Figure 2 or Figure 3 of the accompanying drawings.

Relevant Technical fields

(i) UK CI (Edition K) H4K:KBNA;KBNJ;KBNX

Search Examiner**A C STRAYTON****Databases (see over)**

(i) UK Patent Office

(ii)

Date of Search**15 JANUARY 1992****Documents considered relevant following a search in respect of claims****ALL**

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

SF2(p)

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Category	Identity of document and relevant passages	Relevant to claim(s)

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